to Newton's "Essays on Art and Archæology," and to see how fresh and how living the opinions expressed even more than forty years ago still remain. Though cautious sagacity and a conservative temperament were his prevailing characteristics, yet when the occasion needed he could speak with no uncertain voice; it is a remarkable fact, for instance, that his article on the epoch-making discoveries of Schliemann, written at a time when the attitude of scientific men was still undetermined or opposed, remains to-day, so far as it goes, an admirable exposition of the subject. His attitude on such subjects was specially characteristic of his favourite study—Greek epigraphy—for which a man needs a wide range combined with a patient methodical accuracy. He might, indeed, have said of himself, with his great contemporary, Brunn, "In a critical discussion I would rather err methodically than hit upon the truth without method": a golden watchword for this age of hurry and competition.

NOTES.

PROF. RICHTHOFEN has been elected a Correspondent in the Section de Minéralogie of the Paris Academy of Sciences.

DR. D'ARSONVAL has been appointed to the Chair of Medicine in the Collège de France, in succession to the late Prof. Brown-Séquard.

THE death is announced of Dr. Josef Schröter, Professor of Bacteriology in Breslau University, and distinguished for several important researches in the domain of botany. Among the deaths of other foreign scientific men are: M. Stieltjes, the eminent Professor of Pure Mathematics in the Toulouse University; Dr. C. Studiati, Professor of Physiology in the University of Pisa, and Dr. J. G. Brinton, at Philadelphia. Dr. Brinton was known for his botanical works.

PROF. BLAKE has been appointed by the Government of Baroda to the temporary Directorship of the newly-built State Museum at Baroda, and sails this week for India.

MR. J. E. DUERDEN, Demonstrator of Biology at the Royal College of Science, Dublin, has been elected Curator of the Institute of Jamaica.

THE Paris correspondent of the *Lancet* reports that arrangements have been made at the Pasteur Institute for the immediate despatch of tubes of anti-toxic serum to any part of France. It will thus be seen that M. Roux and his assistants have not been idle. Indeed, both the Institute authorities and the public have worked with a will; the latter having, through the *Figaro*, and by means of gifts made directly to the Institute contributed up to December 31, 1894, no less a sum than 611,000 francs (£24,440). This does not include 100,000 francs (£4000) just voted by the Chambers, and which will doubtless become an annual subsidy. The Institute now possesses, for immunising purposes, a stud of 136 horses, a total that will probably be ultimately increased to the maximum of 150. Of these, twenty are kept by the Municipal Council of Paris at a cost of 20,000 francs (£800) a year, for the benefit of the Paris hospitals and poor. At Villeneuve-d'Étang—a property ceded by the State to M. Pasteur in 1886—there are seventy-nine horses cared for by a capable veterinary surgeon and his staff. That the animals flourish under the *régime* of good feeding and periodical bleedings adopted, is proved by the presence in good health at Alfort of a sturdy Brittany pony which has hitherto supplied no less than 420 litres of blood.

THERE will be a special technical meeting of the Royal Geographical Society, in the Map Room of the Society, on Tuesday, January 22, at 4 p.m., when Prof. A. W. Rücker, F.R.S., will read a paper on "Terrestrial Magnetism."

AN Austrian polar expedition is being organised by Herr Julius von Payer, with the view of securing the artistic representation of the physical features of the east coast of Greenland. The actual work will begin in latitude 74°, and will extend beyond latitude 77°. It is anticipated that the expedition will be ready to start in June 1896.

THE weather has continued very disturbed over the British Islands during the past week; northerly gales have occurred with considerable frequency on our northern and western coasts, but the conditions have been quieter than of late over the southern portion of the kingdom. Heavy snow has fallen in Scotland, causing serious interruptions to the railway and telegraphic services; snow has also fallen in many other parts of the country. Sharp frosts have occurred in the Midland districts, as well as in the north and east; and on Tuesday the thermometer in the screen registered 19° at Wick, while ten degrees of frost occurred in several parts of the United Kingdom.

THE study of the "ejected blocks" from a volcano is a peculiarly interesting one, for by the careful piecing together of evidence much may be learnt of the internal processes which accompany the outward and visible eruptions. This study has been undertaken by Prof. Johnston-Lavis for Monte Somma, and some recently published papers contain a portion of the results at which he has arrived (*Transactions* Edinburgh Geol. Soc. vi. 314). Of the many varieties of stratified rocks that have been torn off from the walls of the volcanic chimney by the rising lava, those of Tertiary age show the least metamorphism; while in the deeper-derived Cretaceous limestones all stages of metamorphism are to be found. The earliest changes appear to be the carbonisation of any organic matter to form graphite, and the recrystallisation of the calcite in larger grains. Then as interchange of constituents takes place between the limestone and the metamorphosing lava, various lime-silicates appear in a fairly definite order, until finally we have formed that great variety of minerals for which Monte Somma has long been famous. The occurrence of *periclase* (MgO) is of interest in view of the abundance of hydrochloric acid among the gases emanating from Vesuvius, for that mineral is artificially prepared by heating magnesia in hydrochloric acid gas. Many of the minerals formed under these conditions of metamorphism tend to decompose rapidly under more normal conditions, and associations of serpentine, tremolite, brucite, &c., are formed, such as are well known in areas of regional metamorphism.

THE analogy between these Vesuvian blocks and certain Archæan rock-masses is carried to a striking extent in a further paper, in the authorship of which Dr. J. W. Gregory joins with Prof. Johnston-Lavis (*Trans. Roy. Dublin Soc.*, vol. v. ser. ii. No. vii.). Here many specimens are described which show in the most complete manner the association of characters that led to the belief in the organic nature of the Canadian *Eozoön*. The authors consequently suggest that the Eozoonal structure in its typical localities was developed in the limestones by the contact metamorphism of the associated crystalline rocks—a view which, they point out, is in harmony with the conclusions arrived at by Prof. Lawson on purely stratigraphical considerations. The disproof of the organic nature of Eozoon may therefore be considered complete.

THE disease of Anbury, or Finger and Toe, is met with wherever the turnip crop is cultivated, but it is probably nowhere more destructive than in the north of England. An experiment bearing on the disease, briefly described in the *Journal* of the Royal Agricultural Society, by Prof. W. Somerville, will therefore interest all agriculturists. The experimenter emphasises the fact that the disease is extremely infectious, and may be easily induced by inoculating a soil perfectly sound with soil from a diseased field. Such diseased soil, however, may be easily disinfected by lime, a fact which points to the pathological phenomena being due to an organism—presumably *Plasmodiophora brassicæ*. This being so, too great care cannot be taken to prevent soil or diseased roots being conveyed from a field which is diseased to another which is sound.

A Society which has a total of more than eleven thousand governors and members, may fairly be said to be in a flourishing condition. Such is the Royal Agricultural Society; and with so great a membership, it is no wonder that a large amount of important work is carried on under its auspices. The current quarterly *Journal* of the Society has among its contents special articles on the rotation of crops, light railways, and the trials of oil engines at Cambridge. It also contains the annual reports of the consulting chemist, Dr. J. A. Voelcker; the consulting botanist, Mr. W. Carruthers, F.R.S.; and the zoologist, Mr. Cecil Warburton. The report of the Council shows that in the Department of Comparative Pathology and Bacteriology, established at the Royal Veterinary College by the aid of a grant from the Society, the work in the research laboratory has included investigations on tuberculosis, diphtheria, anthrax, and other diseases, and the use of mallein and tuberculin for the detection of glanders and tubercle in the earliest stage. The further experiments which have been made, have materially strengthened the evidence in favour of both agents as aids to diagnosis in doubtful cases of disease. We note that the Council have elected as an honorary member of the Society, Prof. W. Fleischmann, Director of the Agricultural Institute of the Royal University of Königsberg, in recognition of his distinguished services to European agriculture. The annual country meeting of the Society will be held this year at Darlington; Leicester has been chosen as the place of meeting for next year.

Every naturalist is acquainted with the elaborate spring-like mechanism by which the woodpeckers and humming-birds are enabled to protrude their tongues with such rapidity for the capture of insect prey. These remarkable instances of adaptation have been more than once described, and some other special modifications of the avian tongue and its bony supports will be recalled by ornithologists. In a recent number of *Der Zoologische Garten* (Frankfurt, xxxv., November, 1894), Herr Schenkling-Prévôt redescribes these cases after a renewed investigation, and also supplies a quantity of interesting information on the form of the tongue and hyoid apparatus of birds in general. The old idea that the woodpecker transfixes its prey with its sharp-tipped tongue is probably not yet extinct, but Herr Prévôt adds his opposition to this opinion, and states that the insects are agglutinated to its tongue by the sticky secretion with which its surface is copiously covered. Although the form of the tongue usually corresponds to the shape of the bill, there are exceptions to this rule, as, for example, in the waders, kingfisher, and hoopoe, which, in spite of their long bills, only possess small cartilaginous tongues; in the pelican, indeed, the tongue is altogether rudimentary. In most birds, whose food consists of seeds, the tongue is dart- or awl-shaped; in others, spatulate; rarely, vermiform or tubular. In some birds, such as the owl, which swallow their prey entire, the tongue is broad and serves as a mere shovel. In the hedge-sparrow, nuthatch, woodcock, and others the tongue is bifid or trifid at its apex, while in the humming-birds the tongue is split into two branches almost to its base, and is used for actually gripping the small insects on which these resplendent little creatures subsist. In a family of parrots (Trichoglossidæ) the tongue is provided at its apex with a brush of some 250–300 hair-like processes. In the parrots, the tongue is thick and fleshy, devoid of horny barbs or papillæ, and is even suspected to possess sense-organs of taste. Herr Prévôt concludes his concise but interesting paper with some remarks on the influence of the form of tongue in birds on their varying powers of articulation. It is interesting to note that the parrots, the form of whose tongues most closely resembles that of man, are able to imitate his language more nearly than any other birds.

The first number of the *Botanisches Centralblatt* gives, from the annual report of the Société des touristes du Dauphiné, an account of the various attempts to establish Alpine botanic gardens in the Jura, Tirol, Styria, the Bavarian Alps, Switzerland, &c.

The number of *Bonnier's Revue Générale de Botanique* for December 15, 1894, contains a biographical sketch of the late Prof. Duchartre, with an enumeration of his contributions to physiological, morphological, and systematic botany, amounting to 240 papers or separate publications.

The first part is published of the *Jahrbücher für wissenschaftliche Botanik* under the new editorship of Prof. Pfeffer and Prof. Strasburger. It contains the following papers:—"Investigations on Bacteria," by Dr. A. Fischer, and "Physiological investigations on the formation of callus in cuttings of woody plants," by Herr H. Tittmann.

Lord Lilford's "Coloured Figures of British Birds" have now reached their twenty-ninth number, and contain a series of excellently-drawn chromo-lithographs of our native species. Four or five more parts are required to finish the work, which, when arranged, will fill ten or twelve crown-octavo volumes.

The veteran naturalist, Dr. R. A. Philippi, of Santiago, has just issued an illustrated memoir, in quarto, on the stags of the Andes, which will form part of the "Annals of the National Museum of Chili." Besides the two ordinarily recognised species of the sub-genus *Furcifer*—*Cervus chilensis* and *C. antisensis*—Dr. Philippi describes a third species, *Cervus brachyceros*, from Northern Peru, which appears to be well established.

The birds of Bulgaria and the adjacent provinces of Turkey have, hitherto, been little investigated by European ornithologists, and are consequently imperfectly known. A good contribution to our knowledge of this subject has just been made by the publication of Reiser's "Ornis Balkanica." The author is Custos of the Museum at Sarajevo, in Bosnia, and has travelled extensively in the Bulgarian provinces.

The 119th number of the *Biologia Centrali Americana* of Messrs. Godman and Salvin, which has recently been issued, contains continuations of the "Birds" by Messrs. Salvin and Godman, of the Coleoptera by Dr. D. Sharp and Mr. Champion, of the Hymenoptera by Mr. Cameron, and of the "Butterflies" by Messrs. Godman and Salvin, all illustrated by coloured plates of the highest excellence. Various other subjects are in progress, and there can be no doubt that the work, when complete, will give us an account of the zoology of an important region of the New World, executed in a style and with a completeness which has hardly ever been approached by any similar undertaking.

An important paper on tropical fodder grasses appears in the *Kew Bulletin* for November. The object of the paper is "to draw attention to a few grasses that have attained to first rank for fodder purposes in the tropics, and to give particulars respecting the conditions under which they have been found to thrive." The information given will be of considerable assistance in indicating grasses suitable for cultivation in tropical countries. It will also show some countries that, while they have been spending time and money in endeavouring to introduce foreign grasses, they have overlooked excellent indigenous grasses close at hand.

Messrs. Blackie and Son have published a small book entitled "First Stage Mathematics." The contents are limited to the requirements of the Code of the Education Department for mathematics as a specific subject.

The publication of Mr. Hutchinson's "Archives of Surgery," which has lapsed for six months, is now being resumed. No. 21 will appear in a few days, with additional letterpress as well as nine plates, and this number, which commences vol. vi., will contain a chronology of medicine from the fifteenth to the nineteenth century. The publishers will in future be Messrs. West, Newman, and Co.

A rough list (No. 147) of rare and valuable books for sale, has been issued by Mr. Bernard Quaritch. The list includes a number of important archæological works, and a few works belonging to the natural sciences. Mr. W. F. Clay has also just issued a list of scientific books, including the works on chemistry lately purchased by him from the library of the late Prince Lucien Buonaparte.

We have received a copy of *El Obrero*, a fortnightly paper published at Quito, Ecuador, with a summary of meteorological observations made at the astronomical observatory at that place for the month of September. Observations in that locality are very desirable, and we are glad to see that their publication is to be continued, and copies to be distributed to a number of places.

The Meteorological Office of Argentina has just issued vol. ix. of its *Anales* in two large quarto parts, forming a splendid contribution to the climatology of that part of the globe. The first part, which contains 678 pages, gives the observations and the means deduced from them, for Cordova, during the years 1872–1892; while the second part, which extends to 400 pages, contains an exhaustive discussion of the data, and of the influence of the various elements on each other, *e.g.* of wind on temperature, &c. It is not possible to give in a brief space any summary of so comprehensive a work. We merely note that the monthly mean temperature varies between 73° in January and 50° in June. The rainfall varies considerably; the mean of a number of years gives about 26 inches. The Director of the Service is G. G. Davis, who is also a member of the International Meteorological Committee, and attended the meeting at Upsala in August last.

Science Gossip is now one of the brightest and most diversified monthlies for the lover of science. The January number is remarkably good. Mr. J. T. Carrington, one of the editors, contributes a number of replies he has received to a letter asking for an opinion upon the use of the word "scientist." The word is never allowed knowingly to appear in contributions to Nature. A twin-elliptic pendulum, exhibited by Mr. Joseph Gould at the Royal Society's soirées last year, is described by the inventor, and seven exceedingly fine figures, drawn by means of the apparatus, are reproduced. There is also a summary of Schiaparelli's views about Mars; and a page of astronomical ephemerides and notes, as well as scientific news, and notes on various branches of natural science. We are glad to see that physical science comes in for a fair share of attention, but there is still room for improvement.

Six volumes have lately been added to the comprehensive series of reprints, "Ostwald's Klassiker der Exakten Wissenschaften," published by Engelmann, of Leipzig. No. 54 contains J. H. Lambert's paper, published in 1772, on the projection of terrestrial and celestial maps. The following number is also on map projection, and is made up of memoirs by Lagrange (1779) and Gauss (1822). Translations of two papers by Sir Charles Blagden, from the *Philosophical Transactions* for 1788, appear in No. 56. The subject is the effect of various substances in lowering the freezing point of water. Treatises on thermometry find a place in No. 57, which includes five of Fahrenheit's papers, three of Réaumur's, and a paper by Celsius. The volume thus comprises all the important communications connected with the foundation of the three thermometric scales. The classical work of Scheele on the nature of air and of fire is reprinted in No. 58 of the series; and No. 59 contains Otto von Guericke's experiments with Magdeburg hemispheres, carried out in 1672. The quaint illustrations of the original paper give this volume additional interest.

The additions to the Zoological Society's Gardens during the past week include a Black-eared Marmoset (*Hapale penicillata*) from South-east Brazil, presented by the Lord Auckland; a Pardine Genet (*Genetta pardina*), a Two-spotted Paradoxure (*Naudinia binotata*) from West Africa, presented by Lieut. F. E. W. Batt; a Sparrow Hawk (*Accipiter nisus*), British, presented by Mr. A. M. Lees Milne; two Long-nosed Crocodiles (*Crocodilus cataphractes*) from West Africa, presented by Captain F. W. Raisin; a Robben Island Snake (*Coronella phocarum*) from South Africa, presented by Mr. G. R. Picton Thwaites; two Grey Parrots (*Psittacus erithacus*) from West Africa, deposited.

Erratum.—In Nature of December 13, 1894, p. 157, column two, line one, for "of a" read "near the." The cascade represented in the note serves to show clearly the overhanging ledge of limestone.

OUR ASTRONOMICAL COLUMN.

The Greater Nebula of Orion.—The numerous photographs that have been taken by means of portrait lenses during the past few years, go to show that many of the so-called celestial spaces are really filled with filmy nebulosities. Dr. Roberts's classical photograph greatly extended the limits of the old Theta nebula in Orion, but few astronomers would care to say that it represents the great "tumultous cloud" in its entirety. Indeed, three photographs obtained by Prof. W. H. Pickering in 1889, with a portrait lens, revealed a large zone of nebulosity surrounding the belt and sword handle, and extending towards γ Orionis. The significance of these photographs has perhaps been somewhat overlooked, but attention is again directed to them by a paper communicated by Prof. E. E. Barnard to *Astronomy and Astro-Physics* for December. By means of a lens only 1½ inches in diameter and 3½ inches focus, Prof. Barnard has recently taken two photographs of the Orion constellation (for the lens takes in nearly the whole constellation at one view), with exposures of two hours and one hour fifteen minutes respectively. These pictures show "an enormous curved nebulosity encircling the belt and the great nebula, and covering a large portion of the body of the giant." Without doubt, the nebulous stream which has left its impression upon Prof. Barnard's photographs, is the same as that of which the existence was recorded by Prof. Pickering. The "Great Nebula" in Orion is therefore but a pigmy compared with the greater nebula thus revealed. It is not too much to believe that in a few years the immense band of nebulosity will be shown to be more or less filled with luminous haze, the old nebula being probably but the brightest part of a nebula involving the whole constellation.

The Transit of Mercury.—We have already noted observations of the transit of Mercury on November 10, 1894, made in Europe and America. News has now reached us of successful observations, made under the direction of Mr. J. P. Thomson, at Mr. F. D. G. Stanley's Observatory, Brisbane. The instrument employed was a 6 inch equatorial by Grubb, stopped down to four inches. Times of contact at egress were carefully taken. When the planet had come sufficiently above the horizon to be observable, it had advanced about two-thirds across the solar surface. The whole periphery of Mercury was remarkably clear and well-defined. There was no trace of haze or vapourous aureola around the disc of the planet, but a bright spot was distinctly seen near the centre. At the instant of internal contact at egress there was a faint phenomenon resembling ligament. This, however, was only momentary. When the external contact occurred, the planet's limb tangential with that of the sun was remarkably clear and sharp. There was not a trace of disturbance, and the phase was regarded as a pure